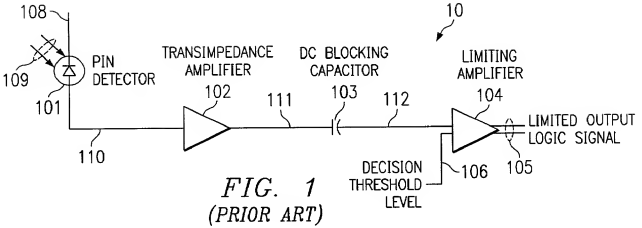


FIG. 1
(PRIOR ART)

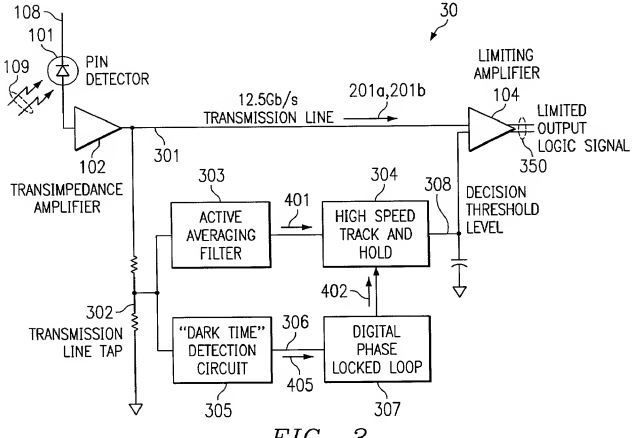


FIG. 3

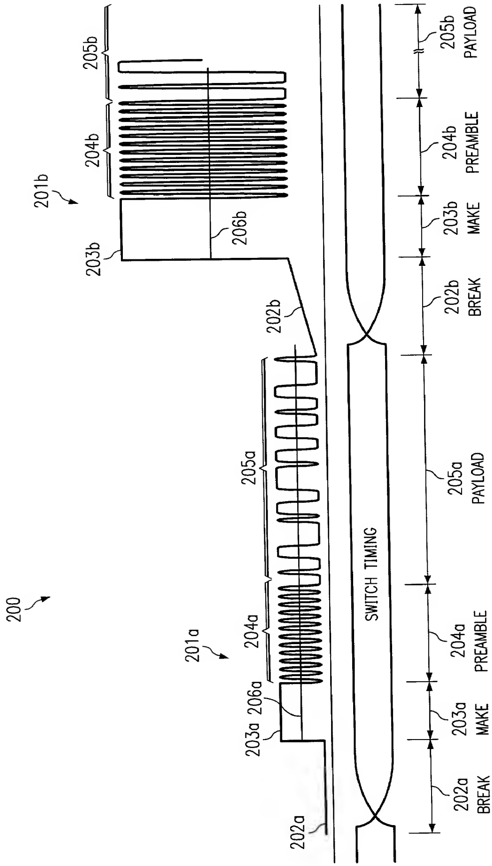

200
201a
201b
202a
202b
203a
203b
204a
204b
205a
205b
206a
206b
SWITCH TIMING
202a BREAK
203a MAKE
204a PREAMBLE
205a PAYLOAD
202b BREAK
203b MAKE
204b PREAMBLE
205b PAYLOAD

FIG. 2

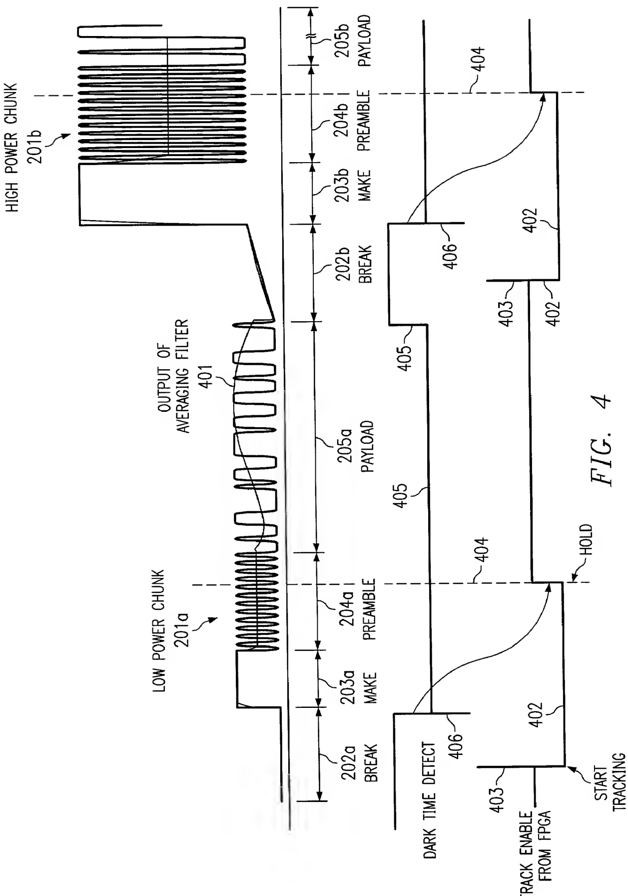

HIGH POWER CHUNK
201b
205b
PAYLOAD
204b
PREAMBLE
203b
MAKE
202b
BREAK
404
406
402
403
402
OUTPUT OF
AVERAGING FILTER
401
405
205a
PAYLOAD
405
404
HOLD
LOW POWER CHUNK
201a
204a
PREAMBLE
203a
MAKE
202a
BREAK
406
402
DARK TIME DETECT
403
TRACK ENABLE
FROM FPGA
START
TRACKING

FIG. 4

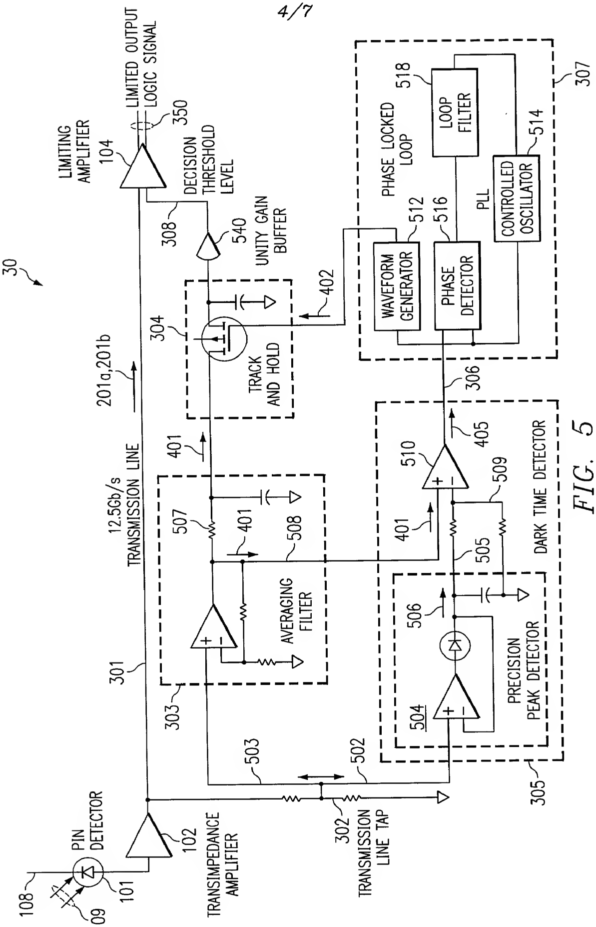

30
PIN DETECTOR
108
109
101
102
TRANSIMPEDANCE AMPLIFIER
302
TRANSMISSION LINE TAP
503
502
301
303
12.5Gb/s TRANSMISSION LINE
201a,201b
507
401
508
AVERAGING FILTER
401
304
TRACK AND HOLD
402
540
UNITY GAIN BUFFER
308
DECISION THRESHOLD LEVEL
LIMITING AMPLIFIER
104
LIMITED OUTPUT LOGIC SIGNAL
350
PHASE LOCKED LOOP
518
LOOP FILTER
514
CONTROLLED OSCILLATOR
PLL
512
516
WAVEFORM GENERATOR
PHASE DETECTOR
307
306
405
510
509
401
505
DARK TIME DETECTOR
506
504
PRECISION PEAK DETECTOR
305

FIG. 5

FIG. 6

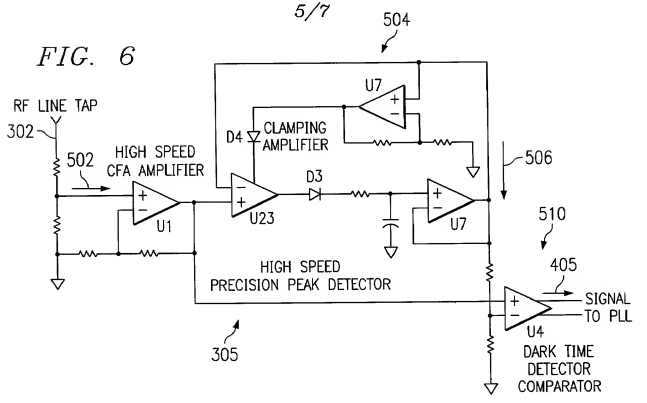
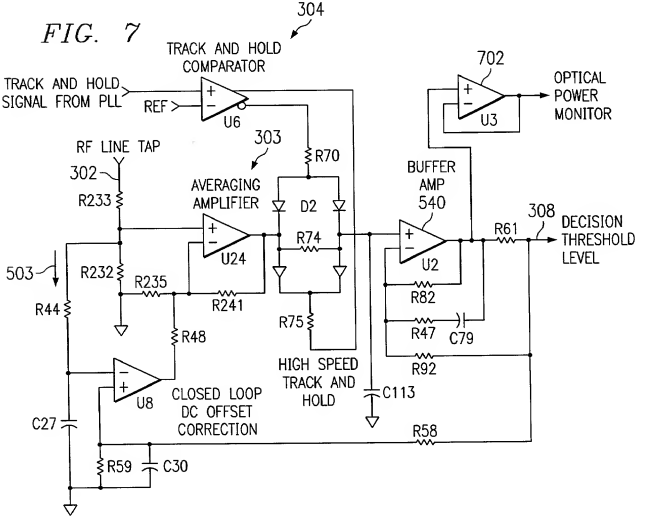

504
RF LINE TAP
302
502
HIGH SPEED
CFA AMPLIFIER
U1
D4
CLAMPING
AMPLIFIER
U7
U23
D3
U7
506
510
405
HIGH SPEED
PRECISION PEAK DETECTOR
SIGNAL
TO PLL
U4
DARK TIME
DETECTOR
COMPARATOR
305

FIG. 7


304
TRACK AND HOLD
COMPARATOR
TRACK AND HOLD
SIGNAL FROM PLL
REF
U6
702
OPTICAL
POWER
MONITOR
U3
RF LINE TAP
302
303
AVERAGING
AMPLIFIER
R233
R70
D2
BUFFER
AMP
540
308
DECISION
THRESHOLD
LEVEL
R61
U24
R74
U2
503
R232
R235
R241
R82
R44
R47
C79
R48
R75
R92
HIGH SPEED
TRACK AND
HOLD
C113
U8
CLOSED LOOP
DC OFFSET
CORRECTION
C27
R58
R59
C30

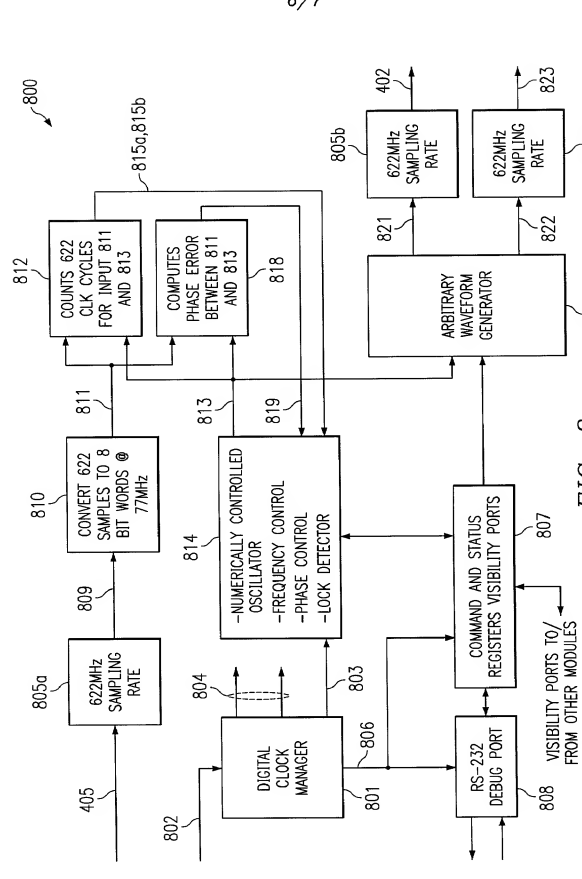

800
815a,815b
812
COUNTS 622 CLK CYCLES FOR INPUT 811 AND 813
COMPUTES PHASE ERROR BETWEEN 811 AND 813
818
811
813
819
810
CONVERT 622 SAMPLES TO 8 BIT WORDS @ 77MHz
814
-NUMERICALLY CONTROLLED OSCILLATOR
-FREQUENCY CONTROL
-PHASE CONTROL
-LOCK DETECTOR
809
805a
622MHz SAMPLING RATE
405
802
804
803
DIGITAL CLOCK MANAGER
801
806
COMMAND AND STATUS REGISTERS VISIBILITY PORTS
807
RS-232 DEBUG PORT
808
VISIBILITY PORTS TO/ FROM OTHER MODULES
ARBITRARY WAVEFORM GENERATOR
820
821
822
805b
622MHz SAMPLING RATE
402
805c
622MHz SAMPLING RATE
823

FIG. 8

FIG. 9